II. Remarks

Support for the various amendments made to the claims herein may be found throughout the application as filed. No new claims are introduced herein, nor are any claims cancelled herein. Claims 4 and 15 are amended herein, however. No new matter has been added as a result of the claim amendments. Applicants respectfully request further examination and allowance of the claims as amended herein in view of the analysis set forth below.

III. Rejection of Claims Made in the Office Action Dated August 21, 2006

In the communication from the Examiner mailed August 21, 2006, the Examiner rejected claims on the following basis:

(1) Claims 4, 8, 9 and 14-20 were rejected under the first paragraph of 35 U.S.C. Section 112 as failing to comply with the written description requirement.

The foregoing rejection is responded to below.

IV. Response to Rejections Made in the Office Action Mailed August 21, 2006

(1) Claims 4, 8, 9 and 14-20 as amended herein, and as previously presented in the Preliminary Amendment Dated June 6, 2006, comply with the written description requirement of Section 112 of the Patent Statute.

In rejecting claims 4, 8, 9 and 14-20 under 35 U.S.C. Section 112, first paragraph, the Examiner stated:

> Claims 4, 8, 9, 14-20 is [sic] rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) at the time the application was filed, had possession of the claimed invention. The currently amended claims were amended after the applicant saw the rejection made by the Examiner and merely tried to overcome the rejection without having support in the original disclosure. The newly added language "said entire code strip based on said calibration area without requiring nay input from said encoding area or said indexing area" is considered new matter.

Discussion concerning, and analysis of, the foregoing argument made by Examiner concerning the purported addition of new matter to the claims as previously amended in a Preliminary Amendment and Response Accompanying the Present request for Continuing Examination (RCE) dated June 6, 2006, or as the claims are amended herein, requires that the Applicants discuss the content of the present application as originally filed.

On the following pages are presented Figures 1A, 1B, 2, 3 and 4 as originally filed. Figs. 1A and 1B have markings thereon showing the locations of calibration areas 113 and 133 illustrated therein. Fig. 2 has markings thereon showing calibration feedback control steps associated with one embodiment of a method of the present invention. Figs 3 and 4 have markings thereon showing calibration feedback control sub-systems illustrated therein.

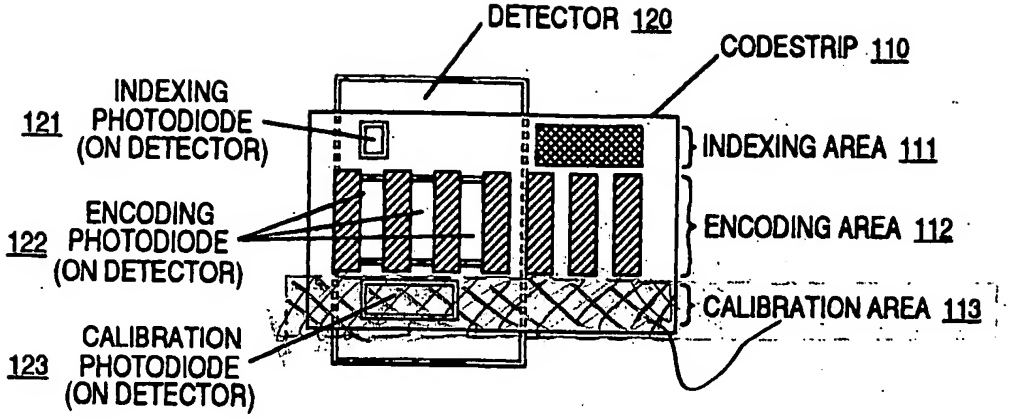

FIGURE 1A

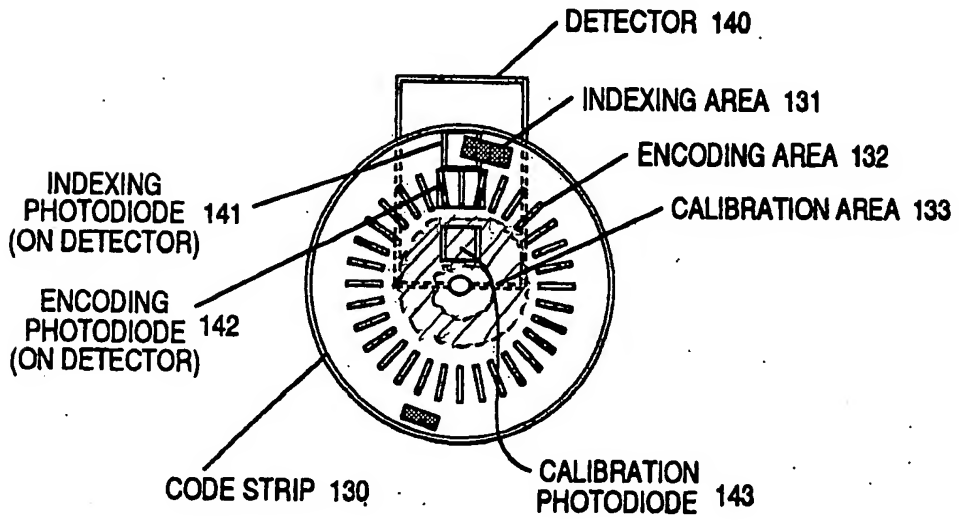

FIGURE 1B

Marked-Up Figs. 1A and 1B from the Present Application

Portions of the specification as originally filed pertaining directly to Figs. 1A and 1B are as follows:

Brief Description of the Drawings, Page 4, Paragraphs 2 and 3:
"Figure 1A illustrates the physical arrangement of the calibration photodiode on the detector and the calibration area on the code strip with respect to each other and the rest of the components of the optical encoder, from the point of view of the light source. Figure IB illustrates an embodiment of the invention where the code strip is a circular disk, having the same indexing encoding and calibration areas. The detector is behind the code strip."

Detailed Description, Page 6, Paragraphs 2 and 3, Page 7, Paragraph 1:
"Figure 1A shows a code strip (110) having an indexing area (111), an encoding area (112) and a calibration area (113). Figure 1A is from the point of view of the light source. Light transmitted through the indexing area (111) is received by the indexing photodiode (121) on the detector (120). Light transmitted through the encoding area (112) is received by the encoding photodiode (122) on the detector (120). Light transmitted through the calibration area (113) is received by the calibration photodiode (123) on the detector (120). The photodiodes on the detector (120) receive only that light which passes through the transparent regions on the code strip. Any dust or other contaminants on the calibration area (113) will decrease the amount of light which the calibration photodiode (123) sees. Figure IB illustrates a code strip (130) in the shape of a disk. The circular code strip (130) has an indexing area (131), an encoding area (132) and a calibration area (133). Light transmitted by the indexing area (131) is received by at least one indexing photodiode (141). Light transmitted by the encoding area (132) is received by at least one encoding photodiode

(142). Light transmitted by the calibration area (133) is received by at least one calibration photodiode (143). Contaminants on the code strip (130) result in less light transmitted by the code strip (130). The calibration area (133) serves as a sample of the degree of transparency of the code strip (130) as a whole. The photodiodes on the detector (120) receive only that light which passes through the transparent regions on the code strip. Any dust or other contaminants on the calibration area (113) will decrease the amount of light which the calibration photodiode (123) sees."

Reference to Figs. 1A and 1B as marked up above shows that calibration areas 113 and 133 are located separately and apart from indexing areas 111 and 131, as well as from encoding areas 112 and 132. Moreover, calibration photodiodes (or detectors) 123 and 143 are located separately and apart from indexing photodiodes 121 and 141, and from encoding photodiodes 122 and 142.

Reference to the above written portions of the specification that pertain directly to Figs 1A and 1B show that it is stated that "[l]ight transmitted through the calibration area (113) is received by the calibration photodiode (123) on the detector (120) . . . . *Light transmitted by the calibration area (133) is received by at least one calibration photodiode (143).* Contaminants on the code strip (130) result in less light transmitted by the code strip (130). *The calibration area (133) serves as a sample of the degree of transparency of the code strip (130) as a whole. The photodiodes on the detector (120) receive only that light which passes through the transparent regions on the code strip.* Any dust or other contaminants on the calibration area (113) will decrease the amount of light which the calibration photodiode (123) sees." This passage from the

specification makes it abundantly clear that no input signals other than those provided by calibration photodiode 123 are provided to modulate the light source to compensate for dust or contaminants on the calibration area.

Claims 4 and 15 as amended in the Preliminary Amendment and Response dated June 6, 2006 included the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said entire code strip based on said calibration area without requiring any input from said encoding area or said indexing area." Claims 4 and 15 as amended herein include the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said code strip based on said calibration area with no input signals being provided to said circuit from said encoding area or said indexing area."

Reference to the above marked-up Figs. 1A and 1B and the excerpts from the specification leaves no doubt that the limitations introduced in claims 4 and 15 herein, as well as in the paper filed June 6, 2006, find plain and abundant support in the present application as filed. Figs. 1A and 1B plainly show that calibration photodiodes 123 and 143 receive input signals only from light that has passed through calibration areas 113 and 133, and not from the encoding or indexing areas. Lest there be any doubt about this assertion, note that the excerpt from the specification set forth above explicitly states "[t]he photodiodes on the detector (120) receive only that light which passes through the transparent regions on the code strip."

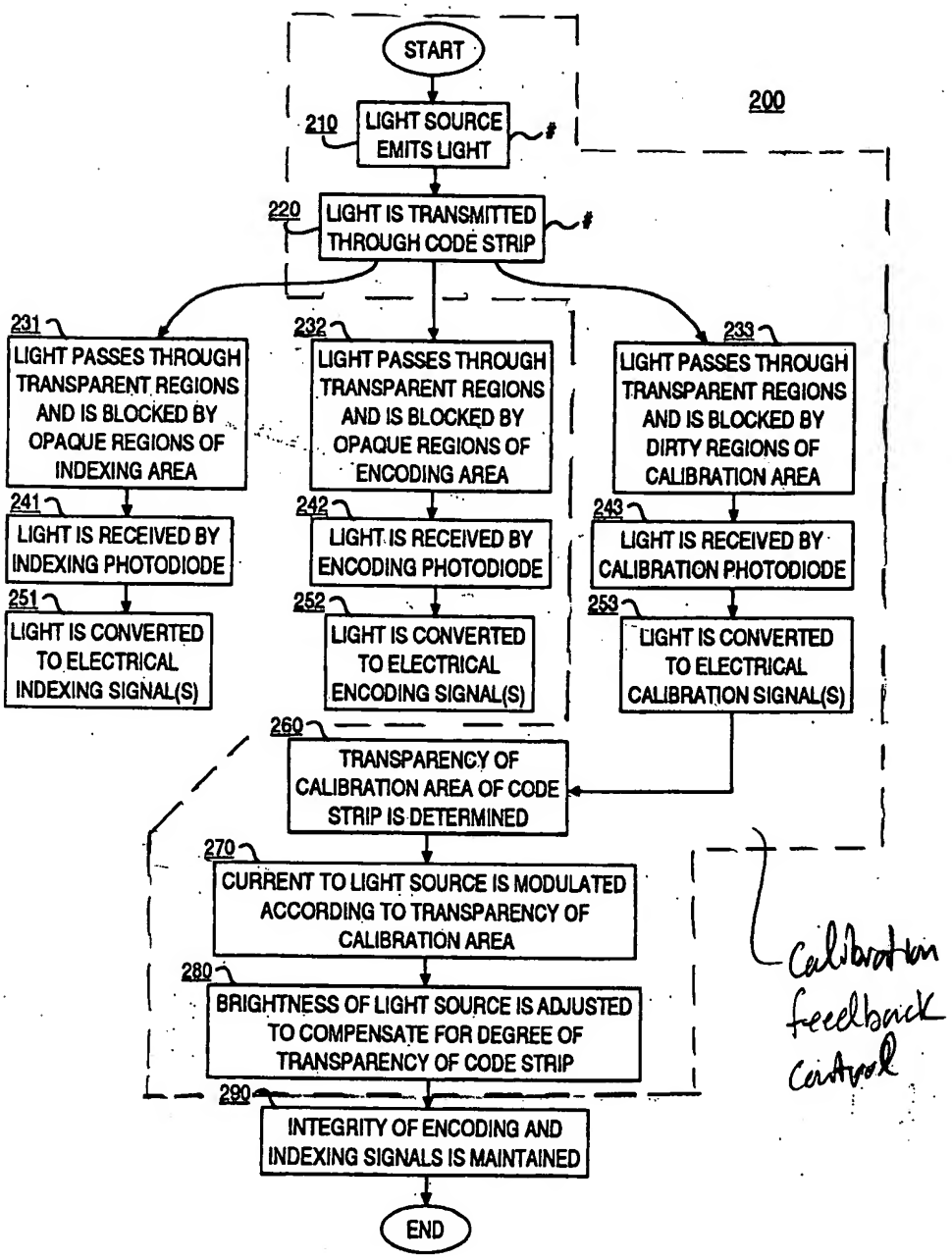

FIGURE 2

Marked-Up Fig. 2 from the Present Application

Portions of the specification as originally filed pertaining directly to Fig. 2 are as follows:

Brief Description of the Drawings, Page 4, Paragraph 4:
"Figure 2 is a flow chart illustrating that the light source emits light, which is transmitted through the code strip, and converted into electrical signals. One of these signals, the calibration signal, is used to determine the degree of transparency of the calibration area on the code strip. This information determines the modulation of the brightness of the light source."

Detailed Description, Page 7, Paragraphs 2 and 3:
"Figure 2 illustrates the process of utilizing the present invention. First, light is emitted by the light source (210). This light is transmitted through the code strip (220). A portion of this light passes through the indexing area of the code strip (231), a portion of which is received by the indexing photodiode (241) and converted into an electrical indexing signal (251). A portion of the light from the light source passes through the encoding area of the code strip (232), a portion of which is received by the encoding photodiode (242) and converted in the electrical encoding signal (252). A portion of the light from the light source (210) passes through the calibration area of the code strip (233), a portion of which is received by the calibration photodiode (243) and converted into the electrical calibration signal (253). Using the electrical calibration signal (253), the transparency of the calibration area of the code strip is determined (260). The current to the light source is modulated according to the transparency of the calibration area (270), thus adjusting the brightness of the light source to compensate for the degree of transparency of the code strip as a whole (280). In this way, the integrity of the encoding and indexing electrical signals is maintained (290)."

Reference to Fig. 2 as marked up above shows that those steps pertaining to calibration feedback control are completely separate and apart from steps relating to indexing and encoding. Indeed, the words "indexing" and "encoding" appear nowhere in the marked-up calibration feedback control steps. Calibration feedback control steps are plainly illustrated and described in Fig. 2 as having nothing to do with indexing or encoding, or receiving or employing signals related to indexing or encoding.

Reference to the above written portions of the specification that pertain directly to Fig. 2 show that it is stated that "*[o]ne of these signals, the calibration signal, is used to determine the degree of transparency of the calibration area on the code strip.*" It is also stated that "[a] portion of the light from the light source (210) passes through the calibration area of the code strip (233), a portion of which is received by the calibration photodiode (243) and converted into the electrical calibration signal (253). *Using the electrical calibration signal (253), the transparency of the calibration area of the code strip is determined (260). The current to the light source is modulated according to the transparency of the calibration area (270), thus adjusting the brightness of the light source to compensate for the degree of transparency of the code strip as a whole (280).*" The foregoing paragraph and Fig. 2 make it clear that feedback control of the light source is accomplished using electrical calibration signal 253, with no signals being provided by the encoding or indexing portions of the device.

Claims 4 and 15 as amended in the Preliminary Amendment and Response dated June 6, 2006 included the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said entire code strip based on said calibration area without requiring any input from said encoding area or said indexing area." Claims 4 and 15 as amended herein include the limitation that

"said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said code strip based on said calibration area with no input signals being provided to said circuit from said encoding area or said indexing area."

Reference to the above marked-up Fig. 2, and to the excerpts from the specification pertaining to Fig. 2, leaves no doubt that the limitations introduced in claims 4 and 15 herein, as well as in the paper filed June 6, 2006, find plain and abundant support in the present application as filed. Fig. 2 and its accompanying text plainly show that calibration feedback control occurs without any input signals from the indexing or encoding areas being provided or employed.

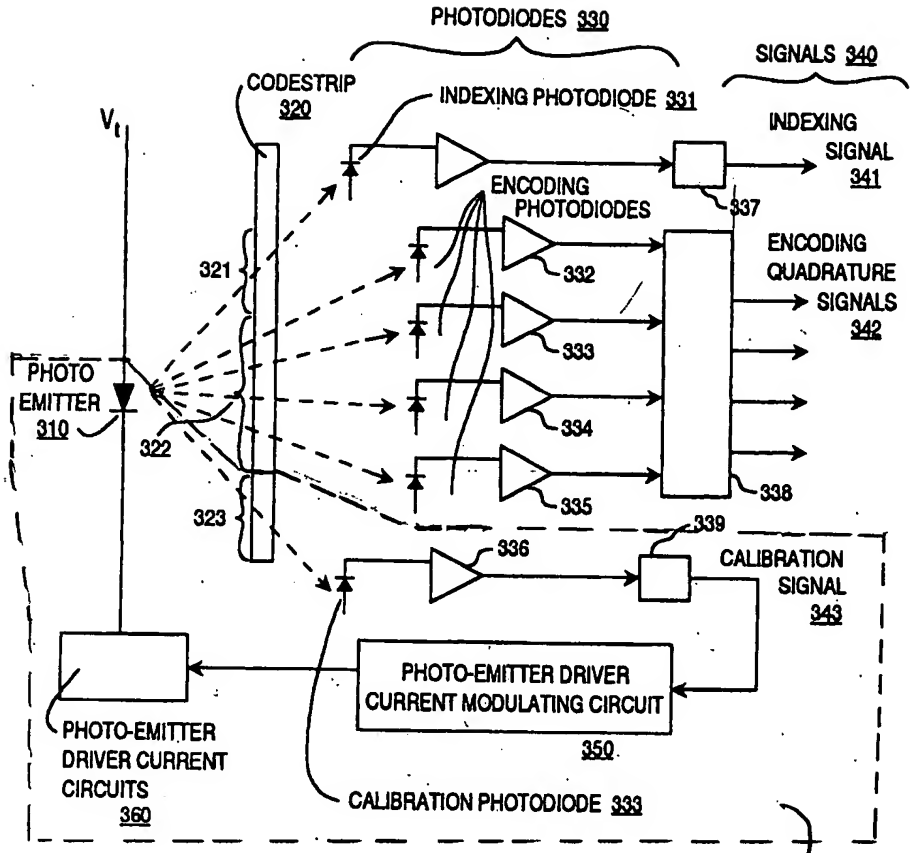

FIGURE 3

Marked-Up Fig. 3 from the Present Application

Portions of the specification as originally filed pertaining directly to Fig. 3 are as follows:

Brief Description of the Drawings, Page 4, Paragraph 5:
"Figure 3 is a diagram of the calibration circuit elements of an embodiment of the invention."

Detailed Description, Page 8, Paragraph 1:
"Figure 3 is a side view of the photo-emitter, the code strip, the detector, and the circuit elements required for the present invention. Figure 3 illustrates the closed loop nature of the present invention, light from the photo-emitter (310) is used to evaluate the transparency of the code strip (320). The portion of the light which passes through the calibration area (323) of the code strip (320) is received by the calibration photodiode (333) and converted into the calibration signal (343). This signal (343) determines whether the current to the light source (310) will increase or remain the same."

Reference to Fig. 3 as marked up above shows that the calibration feedback control sub-system operates completely separate and apart from other sub-systems relating to indexing and encoding. As shown explicitly in Fig. 3, no indexing or encoding signals are provided to photo-emitter driver current modulating circuit 350 or to photo-emitter driver current circuits 360. Only calibration signal 343 is provided as an input to circuit 350, and only calibration photo-diode 333 provides an input to calibration signals 343.

Reference to the above written portions of the specification that pertain directly to Fig. 3 show that it is stated that "[t]he portion of the light which passes through the calibration area (323) of the code strip (320) is received by the calibration photodiode (333) and converted into the calibration signal (343). *This signal (343) determines whether the current to the light source (310) will increase or remain the same.*" Feedback control of the light source is clearly carried out using signals provided by calibration photo-diode 333, and not by the indexing or encoding portions of the device.

Claims 4 and 15 as amended in the Preliminary Amendment and Response dated June 6, 2006 included the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said entire code strip based on said calibration area without requiring any input from said encoding area or said indexing area." Claims 4 and 15 as amended herein include the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said code strip based on said calibration area with no input signals being provided to said circuit from said encoding area or said indexing area."

Reference to the above marked-up Fig. 3, and to the excerpts from the specification pertaining to Fig. 3, leaves no doubt that the limitations introduced in claims 4 and 15 herein, as well as in the paper filed June 6, 2006, find plain and abundant support in the present application as filed. Fig. 3 and its accompanying text plainly show that calibration feedback control occurs without any input signals from the indexing or encoding areas being provided or employed.

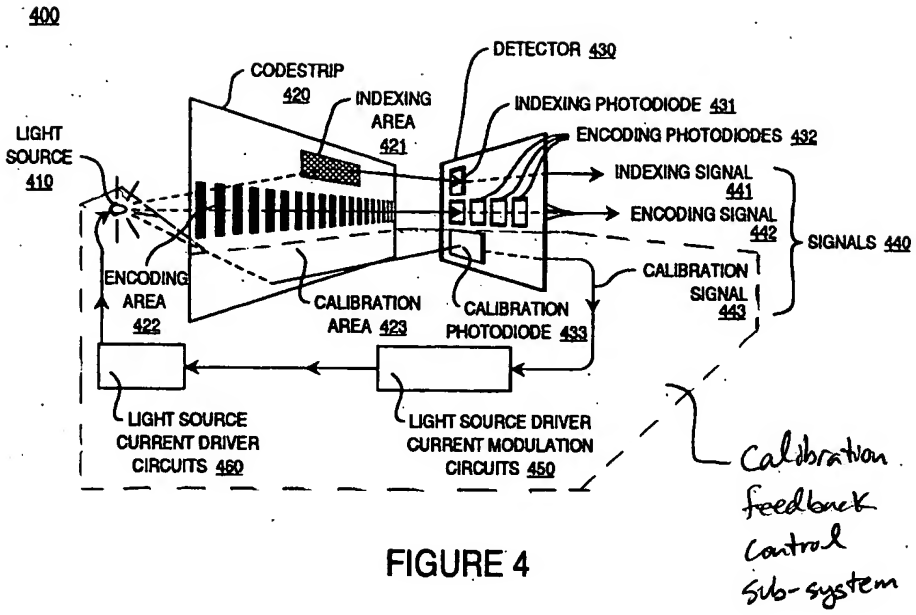

FIGURE 4

Marked-Up Fig. 4 from the Present Application

Portions of the specification as originally filed pertaining directly to Fig. 4 are as follows:

Brief Description of the Drawings, Page 5, Paragraph 1:
"Figure 4 is a representation of the arrangement of the physical components of an optical encoder having a calibration area on the code strip and a calibration photodiode on the detector. Also present in Figure 4 are the circuit responsible for interpreting the calibration signal and the circuit which modulates the current to the light source. The brightness of the light source is adjusted in response to the degree of transparency of the calibration area of the code strip as detected by the calibration photodiode."

Detailed Description, Page 8, Paragraph 2:
"Figure 4 is a three-dimensional view of physical elements of the optical encoder: the light source (410), the code strip (420), the detector (430), the circuit for modulating the current to the light source (450), and the current which controls the light source (460)."

Reference to Fig. 4 as marked up above shows that the calibration feedback control sub-system operates completely separate and apart from other sub-systems relating to indexing and encoding. As shown explicitly in Fig. 4, no indexing or encoding signals are provided to light source driver current modulation circuit 450 or to light source driver circuits 460. Only calibration photo-diode 433 is provided as an input to circuit 450.

Reference to the above written portions of the specification that pertain directly to Fig. 4 show that it is stated that "[t]he brightness of the light source is adjusted in response to *the degree of transparency of the calibration area of the code strip as detected by the calibration photodiode.*" Feedback control of the light source is clearly carried out using signals provided only by calibration photo-diode 433.

Claims 4 and 15 as amended in the Preliminary Amendment and Response dated June 6, 2006 included the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said entire code strip based on said calibration area without requiring any input from said encoding area or said indexing area." Claims 4 and 15 as amended herein include the limitation that "said circuit increases a current to said photo-emitter to compensate for said insufficient transparency of said code strip based on said calibration area with no input signals being provided to said circuit from said encoding area or said indexing area."

Reference to the above marked-up Fig. 4, and to the excerpts from the specification pertaining to Fig. 4, leaves no doubt that the limitations introduced in claims 4 and 15 herein, as well as in the paper filed June 6, 2006, find plain and abundant support in the present application as filed. Fig. 4 and its accompanying text plainly show that calibration feedback control occurs without any input signals from the indexing or encoding areas being provided or employed.

V. Summary

Claims 4, 8, 9 and 14-20 remain pending in the present application. In light of the above remarks, as well as those made in the Preliminary Amendment and Response filed June 6, 2006, Applicants respectfully request reconsideration and allowance of the rejected Claims. The Examiner is invited to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,
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By their attorney

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Date: Nov. 21, 2006

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